AMENDMENT TO THE CLAIMS

1. (Currently Amended) A method for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors, based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components, wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid, the method comprising the following steps to determine an entry in the reverse model look-up table for a device independent target color:

performing a binary search of the forward model look-up table to locate a cell that contains the device independent target color, wherein performing a binary search comprises steps of:

dividing the device independent color space into multiple regions defined by device independent colors with reference to a starting color in device dependent color space;

determining which of the multiple regions contains the device independent target color;

updating the starting color value based on which region contains the device independent target color; and

iterating the dividing, determining and updating steps until a cell containing the updated starting color and a cell containing a previous starting color are the same;

interpolating entries from the forward model look-up table at grid points that define the cell located by the binary search of the forward model look-up table, so as to obtain device dependent colors corresponding to the device independent target color; and

storing the device dependent color at the grid point of the reverse model look-up table for the device independent target color.

2. (Original) A method according to Claim 1, wherein said interpolating step comprises tetrahedral interpolation.

3. to 4. (Cancelled)

5. (Original) A method according to Claim 1, wherein the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space.

6. (Original) A method according to Claim 1, wherein the forward model look-up table is derived by printing color patches corresponding to predefined colors in device dependent color space, and measuring the colors of the patches in device independent color space.

7. (Previously Presented) A method according to Claim 6, wherein the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space.

8. (Currently Amended) An apparatus for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors, based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components, wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid, the apparatus comprising the following means to determine an entry in the reverse model look-up table for a device independent target color:

search performing means for performing a binary search of the forward model look-up table to locate a cell that contains the device independent target color, wherein the search performing means comprises:

dividing means for dividing the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space;

determining means for determining which of the multiple regions contains the device independent target color;

updating means for updating the starting color value based on which region contains the device independent target color; and

iterating means for iterating the dividing, determining and updating means until a cell containing the updated starting color and a cell containing a previous starting color are the same;

interpolating means for interpolating entries from the forward model

look-up table at grid points that define the cell located by the binary search of the forward model look-up table, so as to obtain device dependent colors corresponding to the device independent target color; and

storing means for storing the device dependent color at the grid point of the reverse model look-up table for the device independent target color.

9. (Original) An apparatus according to Claim 8, wherein said interpolating means comprises means for performing tetrahedral interpolation.

10. to 11. (Cancelled)

12. (Original) An apparatus according to Claim 8, wherein the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space.

13. (Original) An apparatus according to Claim 8, wherein the forward model look-up table is derived by printing color patches corresponding to predefined colors in device dependent color space, and measuring the colors of the patches in device independent color space.

14. (Previously Presented) An apparatus according to Claim 13, wherein the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space.

15. (Currently Amended) Computer-executable process steps stored on a computer-readable medium, the computer executable process steps to derive a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors, based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components, wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid, the computer-executable process steps comprising the following codes to determine an entry in the reverse model look-up table for a device independent target color:

code to perform a binary search of the forward model look-up table to locate a cell that contains the device independent target color, wherein said code to perform a binary search comprises:

code to divide the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space;

code to determine which of the multiple regions contains the device independent target color; and

code to update the starting color value based on which region contains the device independent target color; and

code to iterate the code to divide, determine and update steps until a cell containing the updated starting color and a cell containing a previous

starting color are the same;

code to interpolate entries from the forward model look-up table at grid points that define the cell located by the binary search of the forward model look-up table, so as to obtain device dependent colors corresponding to the device independent target color; and

code to store the device dependent color at the grid point of the reverse model look-up table for the device independent target color.

16. (Original) Computer-executable process steps according to Claim 15, wherein said code to interpolate comprises code to perform tetrahedral interpolation.

17. to 18. (Cancelled)

19. (Original) Computer-executable process steps according to Claim 15, wherein the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space.

20. (Original) Computer-executable process steps according to Claim 15, wherein the forward model look-up table is derived by codes to print color patches corresponding to predefined colors in device dependent color space, and to measure the colors of the patches in device independent color space.

21. (Previously Presented) Computer-executable process steps according to Claim 20, wherein the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space.

22. (Currently Amended) A computer-readable medium which stores computer-executable process steps, the computer-executable process steps to derive a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors, based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components, wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid, the computer-executable process steps comprising the following steps to determine an entry in the reverse model look-up table for a device independent target color:

a search performing step to perform a binary search of the forward model look-up table to locate a cell that contains the device independent target color, wherein the search performing step comprises:

a dividing step to divide the device independent color space into multiple regions defined by device independent colors corresponding to small variations from the starting color in device dependent color space;

a determining step to determine which of the multiple regions contains the device independent target color; and

an updating step to update the starting color value based on which region contains the device independent target color

code to iterate the code to divide, determine and update steps until a cell containing the updated starting color and a cell containing a previous starting color are the same;

an interpolating step to interpolate entries from the forward model look-up table at grid points that define the cell located by the binary search of the forward model look-up table, so as to obtain device dependent colors corresponding to the device independent target color; and

a storing step to store the device dependent color at the grid point of the reverse model look-up table for the device independent target color.

23. (Original) A computer-readable medium according to Claim 22, wherein said interpolating step comprises tetrahedral interpolation.

24. to 25. (Cancelled)

26. (Original) A computer-readable medium according to Claim 22, wherein the device independent color space is CIEXYZ or CIELAB color space, and wherein the device dependent color space is CMY or CMYK color space.

27. (Original) A computer-readable medium according to Claim 22, wherein the forward model look-up table is derived by steps to print color patches

corresponding to predefined colors in device dependent color space, and to measure the colors of the patches in device independent color space.

28. (Previously Presented) A computer-readable medium according to Claim 27, wherein the predefined colors are in CMY or CMYK space, and the colors are measured in CIEXYZ or CIELAB space.

29. (Currently Amended) An apparatus for deriving a reverse model look-up table whose entries represent device dependent colors as a function of device independent colors, based on a forward model look-up table whose entries represent device independent colors obtained in response to printout of corresponding device dependent color components, wherein the forward model and the reverse model look-up tables both comprise a grid of cells in their respective color spaces with entries at each grid point of the grid, the apparatus comprising:

a memory including a region for storing the forward model look-up table, a region for storing the reverse model look-up table, and a region for storing executable process steps; and

a processor for executing the executable process steps;

wherein the executable process steps include the following steps to determine an entry in the reverse model look-up table for a device independent target color: (a) performing a binary search of the forward model look-up table to locate a cell that contains the device independent target color, (b) interpolating entries from the forward model look-up table at grid points that define the cell located by the binary search of the

forward model look-up table, so as to obtain device dependent colors corresponding to the device independent target color, and (c) storing the device dependent color at the grid point of the reverse model look-up table for the device independent target color;

wherein said step of performing a binary search comprises:

dividing the device independent color space into multiple regions defined by device independent colors with reference to a starting color in device dependent color space;

determining which of the multiple regions contains the device independent target color;

updating the starting color value based on which region contains the device independent target color; and

iterating the dividing, determining and updating steps until a cell containing the updated starting color and a cell containing a previous start point are the same.

30. (Cancelled)

31. (Currently Amended) A method according to Claim 1, wherein interpolating ~~comprises interpolating~~ entries from the forward model look-up table interpolates device-dependent colors to obtain a device-dependent color corresponding to the device-independent target color.

32. (Previously Presented) An apparatus according to Claim 8, wherein

the interpolating means for interpolating entries from the forward model look-up table interpolates device-dependent colors to obtain a device-dependent color corresponding to the device-independent target color.

33. (Previously Presented) Computer-executable process steps according to Claim 15, wherein the code to interpolate entries from the forward model look-up table interpolates device-dependent colors to obtain a device-dependent color corresponding to the device-independent target color.

34. (Previously Presented) A computer-readable medium according to Claim 22, wherein the interpolating step to interpolate entries from the forward model look-up interpolates device-dependent colors to obtain a device-dependent color corresponding to the device-independent target color.

35. (Previously Presented) An apparatus according to Claim 29, wherein the executable process step of interpolating entries from the forward model look-up interpolates device-dependent colors to obtain a device-dependent color corresponding to the device-independent target color.